

Amendments to the Claims

This Listing of Claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of protecting inert anode assemblies from thermal shock during operation in a metal producing cell comprising:

(1) operating an electrolysis cell having a plurality of inert anode assemblies at over 850°C in a molten cryolite bath, where all of the anode assemblies are shielded by a circumscribed heat radiation shield that is attached to the inert anode assembly, and wherein the heat radiation shield is spaced from the anodes of the inert anode assembly;

(2) withdrawing a shielded anode assembly adjacent to other shielded assemblies thus exposing the other assemblies to lower ambient temperatures; and

(3) inserting a new shielded anode assembly adjacent the other shielded anode assemblies;

wherein the heat radiation shield does not disintegrate in contact with cryolite fumes, remains intact in place above the molten bath, and prevents a temperature drop within its circumscribed assembly of under about 30°C.

2. (Original) The method of claim 1, wherein the heat radiation shield is from about 0.2 cm to 4.0 cm thick and comprises alumina and a material selected from the group consisting of silica, calcia, and mixtures thereof, wherein the alumina content is from 50 wt % to 95 wt %.

3. (Original) The method of claim 1, wherein the anode assembly is withdrawn from the cell and a new shielded replacement assembly is installed in less than 60 seconds.

4. (Original) The method of claim 1, wherein the radiation shield prevents a temperature drop within its circumscribed assembly of under about 20°C.

5. (Original) The method of claim 1, wherein a new shielded assembly is installed in from 10 seconds to 50 seconds.

6. (Original) The method of claim 2, wherein the alumina content is from 60 wt % to 85 wt % and the porosity of the shield is from 5 vol % to 30 vol %.

7. (Original) A method of replacing anode assemblies which are immersed in a bath comprising molten electrolyte in an aluminum electrolysis cell comprising:

(1) operating an aluminum electrolysis cell at a temperature over about 850°C, where a plurality of adjacent anode assemblies are immersed in molten electrolyte, said assemblies being subject to deterioration by at least the electrode and also operating as a heat sink while in the molten electrolyte, where all of the anode assembly comprises an inert shielded anode having an attached, heat radiation shield and act as a radiation shield;

(2) removing at least one anode assembly adjacent another shielded assembly by drawing it out of the molten electrolyte, thus exposing the remaining adjacent shielded anodes to lower radiative external ambient temperatures, wherein the heat radiation shield reduces cooling of the shielded inert anode assembly over about 30°C; and

(3) replacing the removed anode assembly with another anode assembly, wherein the heat radiation shield remains intact and in place above the molten electrolyte bath.

8. (Original) The method of claim 7, wherein the heat radiation shield is from about 0.2 cm to 4.0 cm thick and consists essentially of alumina and a material selected from the group consisting of alumina, silica, calcia and mixtures thereof, wherein the alumina content is from 50 wt % to 90 wt %.

9. (Original) The method of claim 7, wherein the anode assembly is withdrawn from the cell and a new shielded replacement assembly is installed in less than 60 seconds.

10. (Original) The method of claim 7, wherein the shield reduces radiative cooling over about 20°C.

11. (Original) The method of claim 7, wherein the anode assembly is withdrawn from the cell and a new shielded assembly is installed in from 10 seconds to 50 seconds.

12. (Original) The method of claim 7, wherein the molten bath comprises cryolite, where alumina content is from 60 wt % to 80 wt % and the porosity of the shield is from 5 vol % to 30 vol %.

13. (New) An anode assembly for use in an aluminum electrolysis cell, the anode assembly comprising:

a plurality of anodes attached to a support structure assembly; and

a heat radiation shield circumscribing at least two sides of the support structure assembly, wherein the heat radiation shield is spaced from the plurality of anodes, and wherein the bottom of the heat radiation shield extends below the bottom of the support structure assembly.

14. (New) The anode assembly of Claim 13, wherein the bottom of the heat radiation shield is above the bottom of the plurality of anodes.

15. (New) The anode assembly of Claim 14, wherein the distance from the bottom of the heat radiation shield to the bottom of the plurality of anodes is sufficient to allow a bottom portion of the plurality of anodes to be submerged in a molten cryolite bath of an aluminum electrolysis cell without submerging the heat radiation shield in the molten cryolite bath.

16. (New) The anode assembly of Claim 14, wherein the heat radiation shield is able to prevent a temperature drop within the anode assembly of more than 30°C during insertion and removal of adjacent anode assemblies into and from the cryolite bath.

17. (New) The anode assembly of Claim 16, wherein the heat radiation shield comprises alumina and at least one of silica and calcia.

18. (New) The anode assembly of Claim 17, wherein the heat radiation shield comprises between 50 wt % and 95 wt % alumina.

19 (New) The anode assembly of Claim 13, wherein the heat radiation shield is resistant to chemical attack from fluoride fumes.

20. (New) The anode assembly of Claim 13, wherein the porosity of the heat radiation shield is from 5 vol. % to 30 vol. %.